tangible sounds

tangible sounds

exploring contemporary textile design
through collective making

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Tangible Sounds

a catalogue of the Aural Textiles research project
exploring contemporary textile design
through collective making

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Welcome

Welcome to 'tangible sounds', the catalogue of the Aural Textiles research project. We are showcasing the efforts and collaboration of our six textile practitioners from around Scotland. They have participated in a six-month exploration of bio-acoustic pattern making and experimental distributed making. This catalogue shares the overall development

The Aural Textiles project arose from an initial collaboration between George Jaramillo and Lynne Mennie, both enthusiasts of data-driven design and textiles. We saw that existing ways of pattern making in Scotland tend to focus on tartans and tweed and, though important to the overall culture, these limit the potential for new designs that promote contemporary Scottish culture. We are interested in exploring the use of the Scottish sound landscape to influence contemporary textile design through a collaborative design process. The project provided an opportunity for designers/ makers to collaboratively understand and relate to their local soundscape as a source of inspiration and begin to formalise a design narrative based on the non-visual environment, promoting innovative multi-sensory approaches to traditional pattern creations.

This catalogue is the outcome of that collaboration where our participants learned to listen to the landscape, record the sound and transform it into patterns useful for textile creation. Using spectrograms as the audio/visual link, the participants created and iterated a series of patterns and designs using their respective practices to visualise those sounds. In the end, we have not only come up with a series of experimental and contemporary interpretations of the Scottish landscape, but have also provoked hybrid ways of making between the participants. We welcome you to enjoy the patterns, sounds and textiles created in our project.

"The shared nature of the Aural Textiles workshops has provided me with a community rich in its variety of makers, their approaches and textile processes."

Orla Stevens,
Screen Printer

Attuning to place

Human beings are excellent pattern finders and makers, encountering patterns in what they see, hear and feel. Vision plays a dominant role in how these patterns come about, and pattern creation is developed primarily by that which is seen; this is one of the fundamentals of common design practice in most design disciplines. Traditional Scottish textile patterns include woven Highland tartan, Celtic knot work and Fair Isle knitting patterns, as well as industrial developments of Paisley pattern. Most of these are generated, whether pattern and/or colour, from visual stimuli based on the visible landscape.

Patterns for textiles can originate from many stimuli, and multi-sensory approaches to contemporary pattern creation offer the opportunity to maintain the link with the specific environment of the site of origin while bypassing the norms embedded within "traditional" visually-inspired patterns.
The sound landscape is a key component of our multi-sensory environment. Transcending the realm of music, Schafer (1994) introduced the concept of the soundscape in the late 1970s, seeking to make people more aware of the nuanced sounds around us and of listening attentively to the landscape. He suggested that much of the aural landscape is not perceived, yet each of us make sound and nothing is ever silent. In this sense, Schafer tried to engage us with a sonorous world that exists if we just pay attention.

The aural landscape is a significant, yet often ignored, component of the embodied multi-sensory landscape –from the buzz of fluorescent tube lights in an office to the intermittent roar of aircraft flying overhead, no space is ever silent. This attunement to the soundscape is key to developing awareness of the landscape as well as to the space of listening. For example, human voices have internal overtones yet our brains and senses tend to cancel out these sounds. This project attempts to engage

with a sonorous world that exists beyond our conscious, and asks us to listen to it. In this project, we sought to understand how textile patterns could be developed in response to these environmental sounds.

Textile production in a digital age

The nature of textile creation requires physical co-location of maker and equipment to produce items, with some equipment more portable than others: crochet hooks and knitting needles can be carried easily, but not a weaving loom, knitting machine or printing equipment. Designers can be located separately from the place of creation, typically requiring access only to paper & pencil, computer and material swatches, and the ability to interact with the site of creation. However, many practitioners are both designer and creator, particularly in micro-businesses, working within individual studios.

The notion of the lone textile designer-creator is a limiting concept for the modern practitioner, particularly in an age where remote geographies are digitally accessible. Modern practitioners are mobile, diverse and interdisciplinary; they expect to access information, skills and knowledge digitally; and they need to compete more and more with larger commercial/industrial enterprises across the same media platforms. The need for new techniques and acknowledgement of cooperative approaches to textile making, whether between groups of designer-creators or co-creating designs with end consumers, are expected to develop in the next few years. Exploration of mechanisms that support these new interactions (with our environment, between designer-creators and with end users) are needed, and were examined as part of this project.

people

Distributed collective

At the heart of our project is the collective of people who volunteered to take part in our distributed experiment. This collaboration began with the original pair of collaborators whose encounter sparked this project.

Dr. George Jaramillo

George is an innovation designer and lecturer at The Glasgow School of Art, whose background runs from heritage and architecture to landscapes and practice. As part of the Innovation School, his main focus is on challenging historic Highland Romantic perceptions and acknowledging contemporary ruralities. In understanding these ideas, new industries and innovation can be developed to create the future heritage of the region.

Dr. Lynne Mennie

Lynne is a handwoven textile designer and creator and a trained scientist, who works at the intersection of art and science. Coming from at least seven generations involved with the weaving trade in the north-east of Scotland, weaving is in her DNA. Lynne's background in human genetics research inspires designs based on data – a natural synergy with weaving, the technique that is a precursor to digital technology. Lynne first learned to weave using a backstrap loom in south east Asia, and is huge fan of applying "heritage" techniques to create contemporary textiles, both for exhibition and for sale.

Lynne and George discovered a shared passion for textile pattern design from data sources. Initial pilot work allowed for the two to collaborate and test out some initial ideas (Mennie and Jaramillo 2018). This allowed them to secure funding from the Royal Society of Edinburgh, and extend the collaboration to include six textile practitioners from across Scotland. The following section shares short biographies of those six participants.

Dwynwen Hopcroft

Knitting

Dwynwen is the owner of Loch Ness Knitting based in Drumnadrochit, where she sells knitting patterns, yarn, knitted items and holds workshops on natural dyeing. She was taught to knit and crochet as a child by her mother, Margaret. Since then, she has been making, mending and altering most of her own clothes. Since moving to Drumnadrochit, she has rebranded her designs as Loch Ness Knitting and been inspired to take up yarn dyeing. She designs practical modern garments inspired by the natural sights, sounds and weather around Loch Ness and is passionate about developing environmentally conscious business. She has formed partnerships with local business and voluntary groups to provide resources for sustainable natural dyeing.

In 2018, she launched her first book *My Colourful Kitchen*, a collection of recipes for natural yarn dyeing. She is currently working on *My Colourful Garden* and designing a collection of patterns inspired by Highland craft distilleries.

Cally Booker

Weaving

Cally is a textile designer, a maker, and a teacher, but above all, she is a handweaver. Everything she does in her creative practice, from drawing to dyeing, ultimately leads back to the interlacement of warp and weft.

Weaving is a craft which can be meticulously planned or improvised at the loom, and a combination of these approaches appeals to the different parts of her nature. She makes extensive use of multi-layered warps and complex weave structures. The interplay of different layers of colour gives her work a distinctive appeal. In her most recent work she explores the natural colour palette, using up-to-date ecological methods of working with natural dyestuffs, and is focused on developing the sustainability of her practice. As well as functional textiles, Cally creates exhibition pieces which explore social and environmental issues through data. She is currently working on a series which examines the melting of the Arctic Sea Ice.

Beth Farmer

Screen Printing

Beth is a textile designer and community artist and her true passion is to enable others to be creative. She facilitates therapeutic art sessions for Creative Therapies for children, young adults and carers across various mediums, with a particular focus on print. Beth's own practice is about experimentation and collaboration and she designs with the traditional technique of screen printing by hand.

Beth is inspired by the motifs used in the 'Wally' close tile designs which are often elements drawn from nature such as leaves and flowers as well as the dark green and burgundy colour schemes that are so prevalent due to their origination during the Victorian era. Together with her business partner Arianna Mele, Beth has recently set up a screen printing social enterprise called Print Clan, which has been her main focus in 2018. Print Clan aims to break social boundaries by offering everyone the opportunity to learn to screen print.

Olive Pearson

Knitting

Olive Pearson is a designer-maker specialising in contemporary knitted accessories. A lover of colour, geometry and small scale repeat patterns, she is fulfilling a lifelong ambition to design and make her own products. Her distinctive designs are 'simple', colourful repeat geometric patterns that play with perceptions, mixing contemporary colours and patterns with traditional knitting techniques.

Designs are inspired by repetition in both the urban and natural environment - from manhole covers to architectural details and wave patterns. She constructs fabrics on a manual, vintage, machine with current designs inspired by manhole covers, pot stills, and gondolas. To date her designs have been inspired by 'seen' objects and is excited to explore a completely different way of working.

Marie Melnyczuk

Weaving

Marie Melnyczuk is an Artist/Weaver who lives and works on the Isle of North Uist for the last 15 years. She is a sole trader working on developing a 'new' kind of Scottish textile selling work locally, online and also accepting commissions.

She has a Fine Art BA, Painting and Printmaking from Central Saint Martins. After completing a short 'Wool' course at Uist Wool in 2012/13, she discovered the craft of weaving translated well from painting; the ability to mix multi-coloured yarns within a defined construct (rules of warp, weft and the confines of the loom) echoes both painting and printmaking; She appreciates pushing processes, materials, and the loom. Taking inspiration from the islands, she is attempting to map the machair through the sounds of its wildlife.

Orla Stevens

Screen Printing

Orla Stevens is a Textile Designer and Artist based in central Scotland. Recently graduated from Edinburgh College of Art in Textiles, Orla works between mixed media drawing, painting and textile processes. Whether the outcome is on paper or fabric; abstraction, mark making and an experimental approach to medium lies at the heart of Orla's work.

Within the textile discipline, Orla often works with various screen-printing techniques, dyes and hand and machine embroidery to capture colours, marks and 2 and 3 dimensional textures. An instinctive and playful approach to layering – of designs, mediums and processes – allows for endless opportunities of exploration. Through making, Orla responds to the Scottish landscape and its traditional folklore narratives, to explore her surrounding environments and the area's associated heritage.

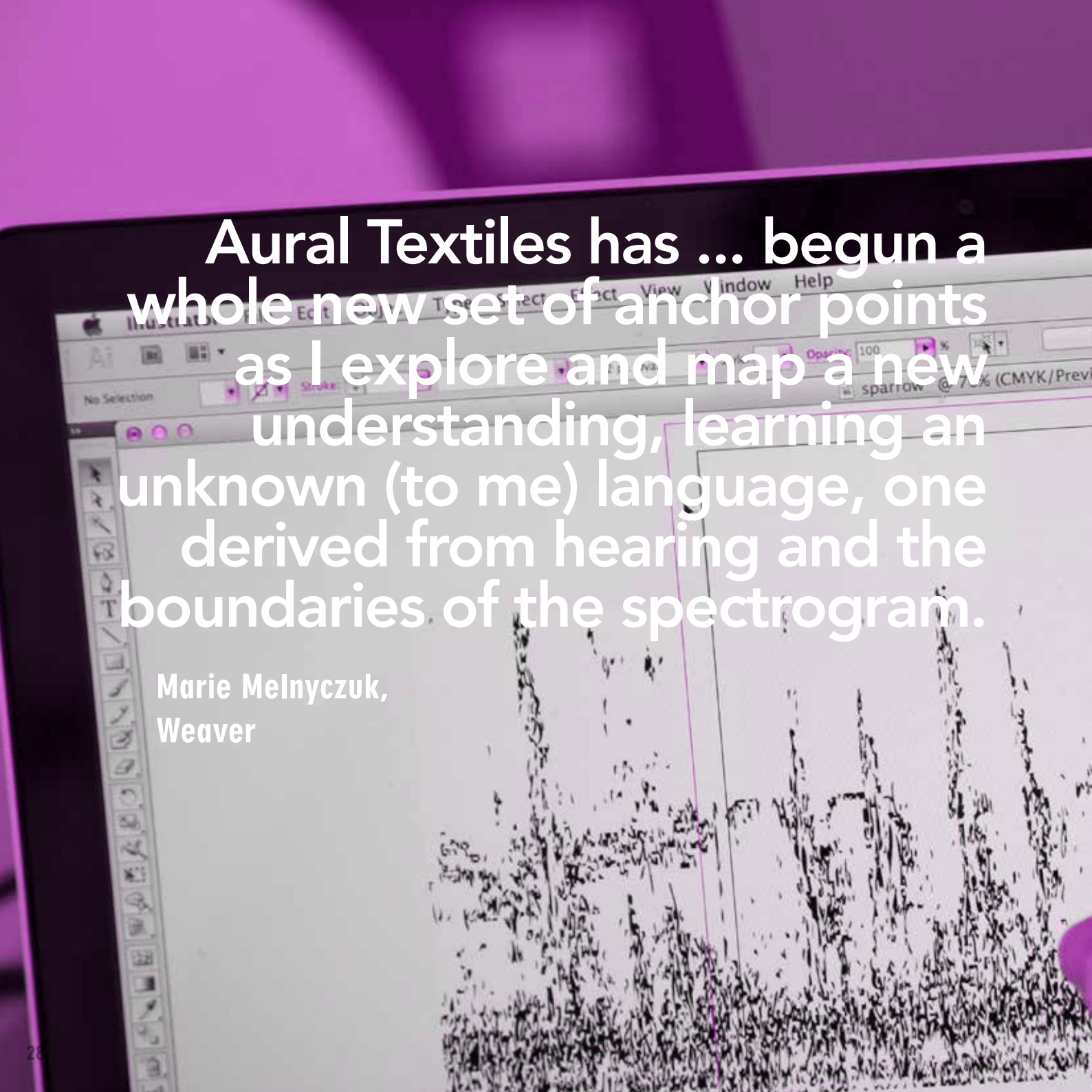
process

From sound to spectrogram

Visualising sounds has existed since the first notation of music was developed in ancient societies (West 1994). In western societies, early Medieval monastic societies developed musical notation with the rise of polyphony, which necessitated a way of allowing many people to understand and follow a series of sounds. By the nineteenth century, these early visualisations and recordings included Edison's phonograph. These systems allowed soundwaves to be visualised on a type of paper or physically carved into grooves and able to be reproduced. These audio wave impressions would be the predecessors to today's digital visualisations, including oscillograms, wave displays, and spectrograms.

Spectrograms are a type of audio visualisation where, rather than the pitch and amplitude (as is normally portrayed through wave modulation), the intensity and multiple frequencies are displayed across time. It is a useful tool in understanding phonetic speech, in bioacoustics applications, and even the vibrations of the earth in seismology. The field of bioacoustics is especially useful in spectrogram use as different animals that normally cannot be tagged, like large underwater mammals or migrating birds, can be tracked by their specific call (like an audio voiceprint).

The spectrogram or audio form becomes the foundation of the pattern. The image can be digitally manipulated to reduce background noise and simplify the bioacoustics pattern, transforming it into a pattern that could be 'read' and reproduced. From this point it is up to the designer/maker to develop a series of transcriptions as part of process between the listener and the sound. The source data from the audio file and digital image manipulation is one aspect of the textile produced; but the finished piece is also dependent upon the interaction between data and designer/maker. This, in turn, is dependent upon the creative process and experience of the designer/maker, and we see that different designer/makers would create completely different textiles from the same spectrogram. The outputs from these interactions are the final textiles.


Aural Textiles has ... begun a whole new set of anchor points as I explore and map a new understanding, learning an unknown (to me) language, one derived from hearing and the boundaries of the spectrogram.
Marie Melnyczuk,
Weaver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Fri 12:58
ESSENTIALS
Document Setup
Preferences

Transforming sound

The basic process is broken down into three main steps of capturing, transforming, and visualising. Participants spent time capturing their soundscape - recording sounds including lapwing and other bird calls, waves, the wind and man-made sounds such as machinery and airplanes overhead - in an attempt to better understand their local environment beyond that which was simply seen. Using smartphones and small audio recorders, we can capture the sounds around us.

From this point, through the use of audio software, we are able to transform the sound into a spectrogram. The image can be digitally manipulated to reduce background noise and simplify the bio-acoustics pattern, transforming it into a pattern that could be 'read' by others. From this transformation point, it is up to the designer/maker to manipulate the image into a textile pattern. For example, segments can be abstracted, repeated, rotated, inverted, and recombined, as is typical for any design process. However, the textile designer must do all of this with reference to the constraints of their specific discipline (whether the number of shafts and treadles on a loom, punch card size on a knitting machine, or screen print dimensions) and the materials used. From a single spectrogram, a huge variety of samples can be visualised both within and across textile disciplines.

CAPTURING

FIND YOUR SOUND.

BIRD OPTIONAL. ANY SOUND CAN MAKE A UNIQUE PATTERN

OPEN UP YOUR PHONE AUDIO RECORDING APP.

YOU CAN ALSO USE A SMALL DICTAPHONE OR STAND ALONE AUDIO RECORDER

RECORD YOUR SOUND.

REMEMBER TO TURN YOUR PHONE UPSIDE DOWN AS MOST HAVE THEIR MICROPHONE ON THE BOTTOM

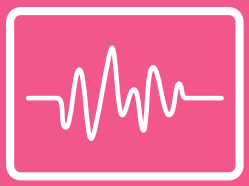
SAVE YOUR SOUND.

REMEMBER TO KEEP TRACK AS TO WHERE, WHERE, AND WHAT WAS HAPPENING WITH THE SOUND

TRANSFER YOUR SOUND

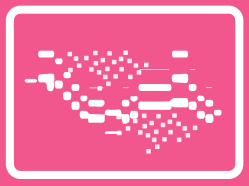
YOU CAN UPLOAD THE FILE TO A CLOUD SERVICE OR DOWNLOAD TO YOUR COMPUTER

TRANSFORMING



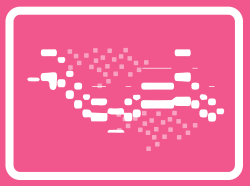
OPEN YOUR SOUND IN PROGRAMME.

AUDACITY OR ADOBE AUDITION ARE TWO GOOD CHOICES. THIS PART OF THE PROCESS CAN ALSO BE DONE ON YOUR PHONE.



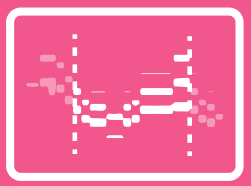
TRANSFORM YOUR SOUND TO A SPECTROGRAM.

THE SPECTROGRAM IS A USEFUL VISUAL REPRESENTATION OF SOUND FOR KNITTING OR WEAVING, HOWEVER, FEEL FREE TO EXPERIMENT WITH THE AUDIO WAVE FORMAT.



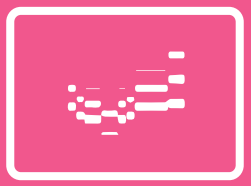
CLEAN UP YOUR AUDIO WITH A (DE) NOISE FILTER.

USE A SECTION OF SOUND WITH BACKGROUND NOISE AS REFERENCE FOR THE FILTER.



CLIP AND SCALE YOUR AUDIO FILE TO THE AREA OF INTEREST.

LOOK FOR A UNIQUE SEQUENCE OF PATTERNS OR GATHER THE ENTIRE TRILL OF A BIRD SONG.



TAKE A SNAPSHOT OF YOUR IMAGE SAVING YOUR FILE.

EXPERIMENT WITH THE TYPES OF PATTERNS ENCOUNTERED AND KEEP MULTIPLE FILES.

VISUALISING

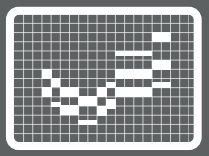
OR

PRINT THE IMAGE.

PRINTING THE IMAGE ALLOWS FOR ANALOGUE FORMS OF EXPERIMENTATION.

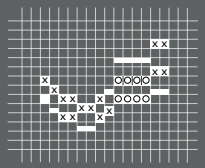
UPLOAD TO A DIGITAL PATTERN GENERATOR APP.

UPLOADING THE IMAGE TO AN ONLINE PROGRAMME ASSISTS IN PATTERN GENERATION.



PIXELATE YOUR PATTERN.

PIXELATING YOUR IMAGE HELPS TO PROVIDE CONSISTENCY AND EASE OF FABRICATION.



RECORD YOUR PATTERN.

REMEMBER TO KEEP A RECORD OF YOUR PATTERN IN THE FORMAT THAT IS MOST APPROPRIATE TO FINAL OUTPUT.

MAKE YOUR PATTERN.

GO AND MAKE YOUR PATTERN BE IT KNITTED, WOVEN, EMBRODIERED OR PRINTED. HAVE FUN AND EXPLORE!


samples

Textile outcomes

Our project included two collaborative workshops where our textile practitioners worked together with us to develop new processes for inventing and generating textile designs using the sound-to-pattern process. It provided an opportunity for the practitioners to share skills and experiences with each other and with the researchers of their different textile disciplines, and to consider the challenges and opportunities of considering a non-traditional design process (from sound + collaborative). Along with sharing and reflecting upon their own practices, a selection of sounds were chosen to form the body of our final work. We present a sample selection of that work here. A complete pattern book of all of the work is available through our online platform.

Great Tit bird song, digitally » manipulated audio file, screen printed with gold and black ink. Cotton fabric, Beth Farmer.

Photo: Cally Booker

» Fair Isle pattern inspired by three elements of wren birdsong spectrogram knitted in a 'dip-dye' effect. Plain and variegated wool yarn, Olive Pearson.

» Footsteps in the snow, striped pattern knitted on vintage machine. Plain and variegated wool yarn, Olive Pearson.

« Sound of the Sea, based on the recording of waves lapping against rocks on the beach at Pittenweem, Fife. Handwoven using wool/silk blend yarn. Cally Booker.

« Combined sounds of branch shaking and a wave on rocks, through a layered application, screen printed using multiple inks on fabric.
Orla Stevens.

« Multiple examples of sound patterns including shaking branches, screen printed using ink on fabric.
Orla Stevens.

The sound of horse clopping, » detail of cable stitching travelling vertically and horizontally. Hand-knitted with wool yarn, Dwynwen Hopcroft.

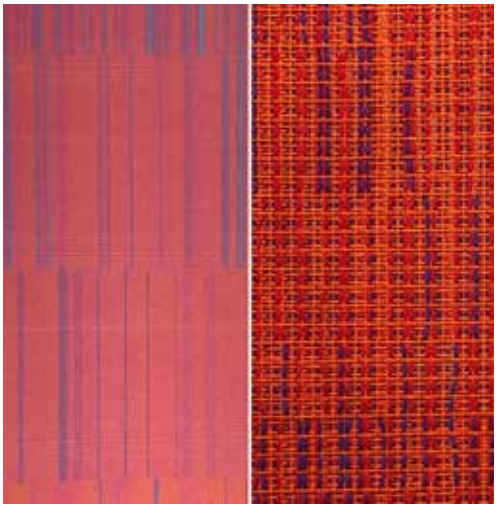
« A collection of three artefacts including the sound of the sea, footsteps on snow and branches shaking. Assorted yarns, Dwynwen Hopcroft, Olive Pearson, Cally Booker.

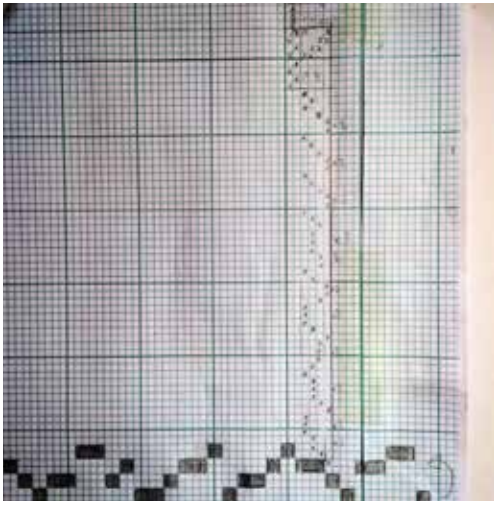
Explorations in 'mapping the machair' of North Uist including swallows and corncrakes, North Uist, Outer Hebrides. Handwoven using wool yarn, Marie Melnyczuk. »

Sound of a wfrom the machair of North Uist, Outer Hebrides. Handwoven using wool yarn, Marie Melnyczuk. »

"A burn trickling over rocks; a wave lapping the shore; raindrops falling onto a shed roof: these all create sounds and images which are rich with design potential."

Cally Booker,
Weaver



Reflections

During this project, we have generated evidence that a novel set of contemporary textile patterns, across a range of textile disciplines, can be generated in response to the aural environment. While described here with reference to the Scottish context, these non-visual design development concepts are equally applicable across other cultures and geographies.

A developing and creative approach to the hybrid digital/analogue inspiration design technique also emerged during this project, with the following key insights:

Firstly, data-driven processes augmented but did not replace the role of the designer/maker. Each practitioner exerted control over the output that was generated from the same input, influenced by their pre-existing skill sets but also by the exchange of information between textile disciplines as the project progressed.

Secondly, digital and data-driven processes provided the opportunity and creative "space" for designer/makers to freely experiment and explore beyond standard practices, including the opportunity to evolve and innovate.

Thirdly, solo practitioners were enabled to collaborate on a shared project at distance. The digital platforms and open source ways of processing and moving information allowed easy exchange of information between practitioners, enabling extended online engagement between participants while also fostering physical encounters and collaborations

Based on these findings, we envisage the possibility that a "customer" could upload a sound recorded in their local soundscape, and see and manipulate this into a pattern for simple algorithmic textile production. Input from experienced textile designers into algorithm development would ensure that the resultant textile would be visually and haptically pleasing to the consumer. Beyond this very simple textile co-creation process, there remain opportunities for further human interaction between the customer-designer and designer-creator for more complex and bespoke knitted, woven or printed/embroidered structures.

Overall, this study promoted innovative multi-sensory approaches to traditional pattern creations; and opened dialogues across the traditional textile disciplines, disrupting the textile manufacturing paradigm.
The potential impact for novel pattern creation and contribution to the evolving field of textile design in contemporary Scottish manufacturing can not only innovate the process of pattern design but, in the long term, promote more open-distributed approaches towards textile production.

Next steps

This collaboration has highlighted a number of further activities that would support designer/makers across Scotland who seek to work with non-visual design inspiration as part of their creative practice and/or business. These include:

• Running further workshops to more widely disseminate the capture-transform-visualise process to other practitioners. This work could also be expanded into educational opportunities within the further and higher education sectors.

• Maintaining and developing the online resource for practitioners to exchange sounds, spectrograms, patterns and experiences in an open-source and collaborative manner.

• Creating a web-based interface that brings together a simple design algorithm with means of bespoke production whereby consumers could personalise a range of textiles based on sounds they had themselves recorded.

• Exploring ways to engage with and build upon the globally-recognised "Scottish textile" brand such that it encompass designs based on sound, including raising awareness of these within and outwith Scotland.

These activities could encompass solo practitioners as well as other small- and medium-scale enterprises (SMEs) within Scotland. Achieving these will require engagement with a number of stakeholders from across Scotland representing practitioners, SMEs, educational providers, the textile industry, and tourism in order to maximise the potential of this emerging non-visually-inspired design process.

Source: Marie Melnyczuk

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Newtonmore Village Hall
Toshacs Tuck Shop, Newtonmore

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